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Landscape Character. The Bedford landscape is dominated by the Concord and Shawsheen Rivers. Tributaries to the two rivers drain watersheds defined by rolling hills, notably Pine Hill and Page Hill, and a generally low topography which declines gradually toward the river basins.

Many residential developments are near areas of mature hardwood forest, with pine groves, old fields and small agricultural areas further contributing to the small town image held and valued by residents. Relatively large undeveloped areas exist near the commercial center of town, the eastern business zone, and between residential neighborhoods. Lands at lower elevations give rise to low-gradient streams bordered by wooded swamp and floodplain in many parts of the town. Protected and undeveloped, these areas provide wide forested buffers and scenic wildlife corridors throughout the community. In areas of steeper slopes, such as Page Hill and Crosbys Hill, the streams are higher gradient and lack wide wetland buffers.

Recent residential and commercial development has resulted in the loss of hillside and lower upland forests, fragmenting habitats and removing forested buffers to scenic areas, existing neighborhoods and wetlands. Bedford's landscape character depends upon the preservation of open space and undeveloped areas through acquisition or protection of woods and fields, thoughtful development of remaining upland areas, and increased wetland and floodplain buffer zone protection.

Concord River and its Tributaries. Bedford has two major riverine systems associated with the Concord and Shawsheen Rivers. Forming the western boundary of the town, the Concord is bordered by extensive wetland and floodplain areas, approximately 700 acres lying within the [Great Meadows National Wildlife Refuge](#)

. The Concord River in Bedford is approximately 400 feet wide and flows for a distance of approximately 3 miles from the Concord to Billerica boundaries. It has a low velocity and flat downstream slope, and retains a fairly constant elevation at approximately 112 feet above mean sea level. The embankments of the river are very low, and are bordered by extensive shrub swamp, red and silver maple floodplain forest, and open marshes. The shoreline in Bedford is undeveloped, and few signs of human habitation are visible.

The Concord River is ideal for small boats, and the Bedford boat landing at the Carlisle Road bridge is a popular launching spot for canoes, rowboats, kayaks and small motorboats. Many of the boats are used for fishing, primarily bass, perch and bluegill.

Two major streams drain the Concord River watershed in Bedford. Tributaries to Mill Brook originate in wetlands lying along the northern section of Springs Road, crossing North Road in two locations to the extensive wetlands between North and Dudley Roads, and joining Mill Brook at the Billerica boundary. Peppergrass Brook rises south of Carlisle Road, receiving flows from a tributary stream east of North Road and from a pond on the Harvard University property off Old Causeway Road. Both brooks are low gradient perennial streams bordered by extensive wooded swamp.

Of significant historical importance, the attractions of the Concord River have been well documented, from Henry David Thoreau to Edwin Way Teale. The stretch of the river in Bedford includes wide and far vistas, significant wildlife habitat, and virtually no development along the banks due to the presence of the Great Meadows National Wildlife Refuge. In recognition of the many values associated with the Concord River, Bedford was one of several towns in the watershed of the Sudbury, Assabet and Concord (SuAsCo) Rivers that jointly sought and obtained federal Wild and Scenic River designation for these waterways.

Shawsheen River and its Tributaries. The headwaters of the Shawsheen originate at Hanscom Field and flow north through the eastern section of Bedford toward Billerica, with expansive grassy marshes and wet meadows bordering most of the northern reach from Page Road to Middlesex Turnpike. The Shawsheen is associated with two distinct floodplains and several small sub-watersheds which drain approximately two-thirds of the town through Elm Brook, Mongo Brook, Kiln Brook, Springs Brook, Beaver Brook, and Vine Brook. Elm Brook, originating in Concord, flows over most of the southern width of the town, converging with the

Shawsheen just north of Great Road in the town center. Mongo Brook flows from Concord Road to Elm Brook, draining the wetlands between Davis and Concord Roads. Springs Brook, originating from Fawn Lake and a pond at Middlesex Community College, flows south to join the Shawsheen River north of Page Road. Vine Brook rises in Burlington at the Burlington and Vine Brook malls, flowing south of Route 62 to the Wilson Mill Pond, and thence through the spillway and north to the Shawsheen near Route 3. Beaver Brook drains a small watershed east of Route 3 in the Middlesex Turnpike area, joining the Shawsheen at the Billerica line.

The Shawsheen River is navigable by canoe or kayak at high water from Great Road in Bedford to Billerica, although the more reliable stretch runs between Route 3 and Middlesex Turnpike. There the river flows through wide open marsh and shrub swamp in a narrow, meandering channel. No formal boat launch exists, although there are several locations for informal access. Occasional river trips are sponsored by regional watershed groups.

The Shawsheen is the site of the earliest settlement of that part of Bedford which was part of Billerica in colonial times. The first settlers in the Bedford area were traders who arrived in the early 17th century and established trading posts on the Shawsheen River to barter with the Indians. Soon grain and saw mills were built on the banks of the Shawsheen, the Concord and their tributaries. Several old homesteads and mill sites still exist close to the Shawsheen's banks. Conservation restrictions have been obtained on several properties from the center of town to Middlesex Turnpike in order to establish a river greenway. The Shawsheen Conservation Area serves as the centerpiece of this effort. Bedford participates in the programs of the [Merrimack River Watershed Council](#) and the Shawsheen River Watershed Association, including water quality monitoring and stream clean-ups of the Elm Brook and the Shawsheen River.

Ponds. Fawn Lake, located within a large area of conservation land, was the site of a prosperous 19th century hotel and resort whose attraction was the presence of healing mineral waters. The shallow, man-made pond is now a popular fishing area, containing bass, sunfish and perch. Perimeter trails are used in all seasons, and skating is possible when the ice freezes to a safe thickness. Two small man-made ponds lie along the railroad bed just north of Fawn Lake in the Buehler Ponds Conservation Area, where hiking trails lead along the shore and south to Job Lane School. The former town reservoir off Shawsheen Road is a pond with some informal recreational use permitted by the town. Other ponds with informal trail access include those at Middlesex Community College, the Harvard University pond south of Huckins Farm, and the Wilson Mill pond off Old Burlington Road. Water quality in all ponds is high enough for fishing; however, no public swimming is allowed within conservation areas or on private lands.

Flood Hazard Areas. The Concord River drains about one-third of Bedford. It is characterized by an extensive floodplain of wetland and glacial lake bottom soil deposits, surrounded by upland glacial till formations. Much of the surrounding landscape of the river is low-lying marsh floodplain. This extensive vegetated floodplain acts to reduce the velocity of flood waters, lower the potential flood level of the river, and delay the time of the flood crest. The extensive, flat lake bottom topography adjoining the Concord River is a safety valve which prevents greater flood damage downstream. The waters of the Concord rise very gradually in Bedford, but the floods tend to be of long duration.

In contrast, because the headwaters of the Shawsheen River underlie a substantial section of Hanscom Field and then flow along stretches of dense development, the resulting fast stormwater runoff characteristics cause the Shawsheen to react quickly to flooding conditions. The result is quick rates of rise, short duration and high velocities - the opposite of the Concord River's flooding action. In the record rainstorm of October 20, 1996, the Concord River floodplain successfully and gradually attenuated the impacts of that storm, whereas basements, parking lots and major roadways along the Shawsheen were severely flooded early in the storm cycle.

Due to the fast runoff characteristics of the Shawsheen watershed, floodwater velocities in the main channel can exceed levels hazardous to developed areas. These high velocities are not only hazardous to structures which may be in close proximity to the river channel, but also have a greater capacity to break loose and carry ice and debris which can clog bridge openings and result in higher flood crests upstream. This is a greater possibility on the Shawsheen than the Concord because of the higher velocities, loss of pervious surface, more extensive development, and floodplain encroachment.

Aquifer Recharge Areas. The majority of Bedford's drinking water is currently supplied by the MWRA. Bedford also draws a significant amount of water from its only remaining active wellfield, associated with the Shawsheen River. The previously active Hartwell and Middlesex Turnpike Wellfields were closed after industrial contamination was first discovered in 1978. Bedford obtained State Legislature approval in 1990 to join the MWRA water service communities in order to augment its water supply which had been depleted by loss of those wells. There are no existing drinking water supply reservoirs in Bedford. The former reservoir off Shawsheen Road is used as a groundwater recharge area for the Shawsheen Road Wellfield. The Concord and Shawsheen Rivers are a source of drinking water for other towns along their watersheds.

Wetlands. There are two major categories of wetlands in Bedford: lake bottom/floodplain

wetlands and upland till wetlands. Lake bottom wetlands are those in the flat floodplains of the Concord and Shawsheen Rivers and their tributary streams. These wetlands are characterized by a year-round high water table, broad expanses, sections of open marsh, and seasonal flooding. They are generally continuous, with perennial streams traversing through them. The upland till wetlands are much smaller elongated and discontinuous wooded wetlands, interconnected by often fast-running brooks. These are called "perched" wetlands when the water table is trapped above impermeable soils or rock. These upgradient wetlands act as interconnected sponges which modify the fast runoff from poorly drained soils.

Typical lake bottom wetlands exist as red maple swamps such as those along Davis Road, in the Vanderhoof Conservation Area, Hartwell Town Forest, and the Massport property north of Hanscom Field. Remnants of an extensive Atlantic white cedar swamp forest remain along Davis and Carlisle Roads. Shallow marsh wetlands and shrub swamp have developed along the Shawsheen and Concord Rivers. Wet meadows persist in old agricultural fields at Huckins Farm and the Clark Conservation Area, maintained either by periodic flooding or mowing. Isolated wetlands are common in Bedford, and typical examples are visible along Hartwell Road, at the Mary Putnam Webber Wildlife Preserve, and along the Middlesex Turnpike. These isolated wetlands often function as vernal pools.

Woods. When the area now known as Bedford was first explored, it was described as "right up in the woods" and "a desert, where bears and wolves abide" (from *An Historical Sketch of the Town of Bedford*

). During the succeeding colonial period and into the beginning of this century, the land was cleared for agriculture. Abandoned fields, pastures and meadows have since reverted to woodland, and Bedford once again has significant acreage in mixed upland forest cover. Most of these wooded areas are uplands dominated by red and white oak or white pine groves. Occasional mature stands of beech and hemlock persist. Wooded swamp with an overstory of red maple is the typical forest cover in most Bedford wetlands.

Even though Bedford is extensively developed, forest cover accounts for the greatest amount of acreage in town. By far the greatest percentage of forest cover is hardwood species, including oak, maple, ash, hickory, locust and birch. Softwood stands such as white pine are not extensive. An unusual forest cover type in Bedford is Atlantic white cedar swamp, where cedars exist in remnant colonies from Davis Road to Huckins Farm. The stands of white cedar are vulnerable to fluctuations in hydrology and competition by red maples.

Numerous hiking trails exist through these woodlands, the most popular trails located at Hartwell Town Forest and Huckins Farm. White pine groves vary the landscape and provide

other types of wildlife habitat at Hartwell Forest, Wilderness Park, Minnie Reid, and the Mary Putnam Webber Wildlife Preserve. The trails through Wilderness Park traverse both hardwood forest and white pine groves, and pass the largest white pine in Bedford. Many trails exist on private property, and are used informally with the permission of the landowner.

Vegetative Communities. Common wetland shrubs include sweet pepperbush, highbush blueberry, winterberry holly and viburnums. An unusual shrub found at several locations between Davis Road and Harvard Drive is swamp sweetbells. Typical upland shrubs in forested areas are huckleberry and low bush blueberry. Native herbaceous plants of interest include many wildflowers and ferns, with cinnamon fern growing to more than five feet in the Carlson Conservation Area. The more unusual maidenhair spleenwort and Virginia chain fern have also been identified. Cardinal flower is occasionally seen along streams and open wetland edges.

An Historical Sketch of the Town of Bedford includes an extensive list of the plants occurring in Bedford over a century ago, half of which are still commonly encountered. The following rare plant species were once observed in Bedford: arethusa, round-fruited false loosestrife, pale green orchis, Britton's violet, purple needlegrass, adder's tongue fern, Indian paintbrush, Andrew's bottle gentian, New England blazing star, tiny cow-lily, lion's foot, and wild senna.

Numerous non-native invasive plant species are of concern in Bedford. Purple loosestrife and common reed have become established in watercourses and in open wetland areas such as the Carlson Conservation Area and Shawsheen River Conservation Area. Glossy buckthorn is an aggressive colonizer of disturbed wooded areas, competing with native shrubs in uplands and wetlands. Garlic mustard, Japanese barberry and honeysuckle are common in wooded areas. The Conservation Commission requires the use of native species in wetland replication and buffer zone restoration.

Fisheries and Wildlife. The mixed hardwood forest cover interspersed with white pine has matured to favor a burgeoning wildlife population. White-tailed deer range throughout Bedford into the most settled areas, deriving their habitat base from the continuous forest corridors with dense shrub understories, the well-wooded residential areas and the protected Great Meadows National Wildlife Refuge. Coyote are observed with increasing frequency. Red and gray squirrels, ground-hogs and smaller mammals are common. Mink and otter are reported several times a year in the vicinity of the well-buffered tributary streams, and there are occasional indications that black bear and moose are passing through. Fisher is frequently reported, most often from the western part of town.

Bird populations are varied and diverse, from the typical songbirds to great horned owl reported at Hartwell Forest, Huckins Farm, Pine Hill and Bedford Meadows. Barred owl and pileated woodpecker have been seen at Wilderness Park. Bobolink are observed every year at Clark Conservation Area, which provides the required open meadow habitat. Bedford's mature forested areas are critical for many of the recorded species; for example, the increasingly numerous flocks of wild turkey are dependent upon areas of mature oak and beech. At Wilderness Park, the large white pine and hemlocks are ideal owl roosting areas, while the adjoining open marsh and shrub swamp along Springs Brook provide hunting habitat. The Great Meadows National Wildlife Refuge publishes a bird list of 221 species.

A spectacular north-south wildlife corridor exists along the Concord River. In Bedford this corridor extends eastward virtually uninterrupted to North Road and Davis Road through the Minnie Reid Conservation Area, Huckins Farm, the Harvard University property, the Carlisle Road Conservation Areas, the Langone Conservation Area and Bedford Meadows Conservation Restriction, and the Pine Grove Farm Conservation Area. The Springs Brook area includes a complex of conservation lands, town lands, and other public and private undeveloped lands extending north to south from Middlesex Community College to Page Road. The stretch of uninterrupted wooded swamp extending west from Hartwell Forest through Massport property and town-owned conservation lands to Concord Road is another wildlife resource, with the east-west railroad bed and its bordering undeveloped lands providing both recreational and wildlife connections.

The following rare or unusual wildlife species have been documented in Bedford: spotted, Blanding's and eastern box turtle, blue-spotted and four-toed salamanders, grasshopper sparrow, upland sandpiper, and Cooper's and sharp-shinned hawks. Large upland fields are increasingly uncommon in Massachusetts, and the expansive grasslands associated with the runways at L.G. Hanscom Field provide important habitat for rare avian species.

Bedford has participated in various wildlife and biodiversity surveys, has conducted many vernal pool certification studies, and has commissioned specific botanical and herpetological surveys of areas of particular interest and potential for diversity. The protected wetlands of the Concord River within Great Meadows and adjacent Town lands harbor populations of state-listed turtles, and several nearby wetland and upland areas within this corridor have recently been acquired and protected. Several vernal pools have been formally certified by the state; some of those pools provide habitat for rare salamanders.